29 can be found at least, for example, on page 4, lines 33-36 and page 16, lines 19-21. Support for the amendment to claim 57 can be found at least, for example, on page 6, lines 20-30, and on page 17, lines 10-31.

No new matter has been added. Applicants request that the amendments to the specification and claims be entered. For the Examiner's convenience, a copy of the claims as currently pending after the amendments herein is provided as Appendix B.

Cancellation and/or amendment to the claims should in no way be construed as an acquiescence to any of the Examiner's rejections and was done solely to expedite prosecution.

Objection to the Drawings

The Office Action (paragraph 2) indicates that the drawings are objected to. Corrected formal drawings will be submitted by Applicants allowance of all subject matter.

Rejection of Claims 27-30 and 55-60 under 35 USC § 102(a)

The Examiner states that claims 27-30 and 55-60 are anticipated by Funk *et al.* Applicants submit that Funk *et al.* is not available as a reference under 35 U.S.C. §102(a). The present application is a continuation of Application Serial Number 08/175,158, now U.S. Patent No. 5,986,067, which was a continuation-in part of Application Serial Number 07/832,029 filed February 6, 1992, now abandoned, which was a continuation-in-part of U.S. Application Serial Number 07/652,869 filed February 8, 1991, now abandoned. As such, the present application claims priority to the parent application filed February 8, 1991.

Funk *et al.* was published on February 15, 1990, less than one year before the priority date of this application. Funk *et al.* is the work of Applicants as established by the In re Katz declaration under 37 C.F.R. § 1.132 filed March 25, 1993, a copy of which submitted herewith as Appendix C. This declaration was previously filed in parent Application Serial Number 07/832,029. Applicants traverse this rejection on the grounds that 35 USC § 102(a) applies to art by a third party, and Funk *et al.* is the work of the

Applicants. As such, Funk *et al.* is not available as prior art under § 102(a) and Applicants respectfully request that the rejection under 35 USC § 102(a) be withdrawn.

Rejection of Claims 27-30, 38-40, and 55-60 under 35 USC § 102(b)

The Examiner states that claims 27-30, 38-40, and 55-60 are anticipated by Woodworth *et al.* Claim 30 has been canceled rendering the rejection moot as to this claim. With respect to the remaining claims, it should be noted that the Woodworth *et al.* abstract provided by the Examiner does not coincide with the written citation on said reference. The abstract provided by the Examiner, entitled "Recombinant Human Transferrin N-Terminal Half-Molecule: Characterization of Selectively Deuterated and Mutated Proteins," is an abstract from a 1990 UCLA Symposium entitled "The Inorganic Chemistry/Molecular Biology Interface." The citation *J. Cell Biochem.*, supp. O (13 part A:31), 1989 handwritten on the reference does not correspond to the abstract provided. For the purpose of this response, Applicants address the Woodworth *et al.* reference from 1990 provided by the Examiner as follows.

The present application is a continuation of Application Serial Number 08/175,158, now U.S. Patent No. 5,986,067, which was a continuation-in part of Application Serial Number 07/832,029 filed February 6, 1992, now abandoned, which was a continuation-in-part of U.S. Application Serial Number 07/652,869 filed February 8, 1991, now abandoned. As such, the present application claims priority back to the parent application filed February 8, 1991. Woodworth *et al.* was presented at a UCLA symposium dated February 24 to March 1, 1990, less than one year before the priority date of this application. Woodworth *et al.* is a publication by Applicants. Accordingly, under §102(a), Woodworth *et al.* is not available as prior art. Applicant respectfully requests, therefore, that the rejection of claims 27-30, 38-40, and 55-60 be withdrawn.

Rejection of Claims 27-31 and 55-60 under 35 USC § 103(a)

The Examiner has rejected claims 27-31 and 55-60 under 35 U.S.C. 103(a) as being unpatentable over Bowman *et al.* in view of Woodworth *et al.* The Examiner states that Bowman *et al.* "teaches the cloning of human serum transferrin, and differs from the

instant invention in that expression of the cloned gene was not accomplished." To make up for the defiencies of Bowman et al., the Examiner cites Woodworth et al. as providing an expression system for the amino terminal half of transferrin. For the reasons stated above, it is Applicants' position that Woodworth et al. is not available as prior art against the instant claims. As the teachings of Bowman alone appear to be insufficient, Applicants respectfully submit that the rejection under 35 USC § 103(a) be withdrawn.

CONCLUSION

In view of the foregoing remarks, reconsideration of the rejections and allowance of all pending claims is respectfully requested.

If a telephone conversation with Applicant's Attorney would expedite the prosecution of the above-identified application, the examiner is urged to call Applicant's Attorney at (617) 227-7400.

Date: November 9 , 2001

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APPENDIX A

VERSION WITH MARKINGS TO SHOW AMENDMENTS MADE

27. (Amended) An eukaryotic expression vector, comprising a nucleic acid encoding full length human serum transferrin linked to appropriate genetic regulatory elements for expression in an eukaryotic cell.

28. (Amended) An eukaryotic expression vector, comprising a nucleic acid encoding a human serum transferrin C-terminal lobe ~~half~~ molecule comprising at least the binding domain of a single lobe of transferrin linked to appropriate genetic regulatory elements for expression in an eukaryotic cell.

29. (Amended) An eukaryotic expression of vector of claim 27 or 28, wherein the vector includes a nucleic acid encoding transferrin signal sequence linked to the nucleic acid encoding the transferrin or transferrin C-terminal lobe ~~half~~ molecule.

38. An eukaryotic expression vector comprising a nucleic acid encoding a human serum transferrin mutant having a mutation in at least one amino acid residue selected from the group consisting of Asp63, Gly65, Tyr95, Tyr188, His249, Asp392, Tyr426, Tyr517 and His585 of SEQ ID NO:2, wherein the encoded mutant retains the ability to bind metal.

39. An eukaryotic expression vector comprising a nucleic acid encoding a human serum transferrin N-terminal lobe mutant having a mutation at Asp63 or Gly65 of SEQ ID NO:2, wherein the encoded mutant retains the ability to bind metal.

40. The vector of claim 38 or 39, wherein the encoded mutant has Asp63 of SEQ ID NO:2 mutated.

55. An eukaryotic cell line transfected with the vector of any one of claims 27, 28, 32, 33, 38, 44 and 45.

56. The cell line of claim 55 which is a baby hamster kidney cell line.

57. (Amended) A method of producing functionally active full length human transferrin, or a C-terminal portion or mutant thereof, comprising:

a) culturing the eukaryotic cell of claim 55, under conditions conducive to expression of the encoded transferrin; and

b) recovering the expressed transferrin.

58. The method of claim 57, wherein the vector further comprises an inducible promoter of transferrin operably linked to the transferrin-encoding nucleic acid, said method further comprising inducing the promoter in order to induce expression of transferrin.

59. The method of claim 58, wherein the promoter is the zinc inducible metallothionein promoter.

60. The method of claim 59, wherein the vector is the plasmid pNUT.

APPENDIX B

27. An eukaryotic expression vector, comprising a nucleic acid encoding full length human serum transferrin linked to appropriate genetic regulatory elements for expression in an eukaryotic cell.

28. An eukaryotic expression vector, comprising a nucleic acid encoding a human serum transferrin C-terminal lobe molecule comprising at least the binding domain of a single lobe of transferrin linked to appropriate genetic regulatory elements for expression in an eukaryotic cell.

29. An eukaryotic expression of vector of claim 27 or 28, wherein the vector includes a nucleic acid encoding transferrin signal sequence linked to the nucleic acid encoding the transferrin or transferrin C-terminal lobe molecule.

38. An eukaryotic expression vector comprising a nucleic acid encoding a human serum transferrin mutant having a mutation in at least one amino acid residue selected from the group consisting of Asp63, Gly65, Tyr95, Tyr188, His249, Asp392, Tyr426, Tyr517 and His585 of SEQ ID NO:2, wherein the encoded mutant retains the ability to bind metal.

39. An eukaryotic expression vector comprising a nucleic acid encoding a human serum transferrin N-terminal lobe mutant having a mutation at Asp63 or Gly65 of SEQ ID NO:2, wherein the encoded mutant retains the ability to bind metal.

40. The vector of claim 38 or 39, wherein the encoded mutant has Asp63 of SEQ ID NO:2 mutated.

55. An eukaryotic cell line transfected with the vector of any one of claims 27, 28, 32, 33, 38, 44 and 45.

56. The cell line of claim 55 which is a baby hamster kidney cell line.

57. A method of producing functionally active full length human transferrin, or a C-terminal portion or mutant thereof, comprising:

a) culturing the eukaryotic cell of claim 55, under conditions conducive to expression of the encoded transferrin; and

b) recovering the expressed transferrin.

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58. The method of claim 57, wherein the vector further comprises an inducible promoter of transferrin operably linked to the transferrin-encoding nucleic acid, said method further comprising inducing the promoter in order to induce expression of transferrin.

59. The method of claim 58, wherein the promoter is the zinc inducible metallothionein promoter.

60. The method of claim 59, wherein the vector is the plasmid pNUT.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE,

Applicants: Walter D. Funk et al.

Serial No.: 07/832,029 Examiner: Bugaisky, G.

Filed: February 6, 1992 Group Art Unit: 1814

Title: RECOMBINANT TRANSFERRINS, TRANSFERRIN HALF-MOLECULES AND MUTANTS THEREOF

Attorney's Docket No.: UVI-005CP

The Honorable Commissioner
of Patents and Trademarks
Washington, D.C. 20231

DECLARATION

We, Walter D. Funk of 11991 Audelia Road, Apt. 2202, Dallas, Texas 75243, U.S.A., Ross T.A. MacGillivray of 4014 West 21st Avenue, Vancouver, British Columbia V6S 1H9, Canada, Anne B. Mason of North Greenbush Road, Charlotte, Vermont 05445, U.S.A and Robert C. Woodworth of 4 Logan Lane, Shelburne, Vermont 05482, U.S.A., declare:

1. We are co-applicants of Application Serial No. 07/832,029 filed February 6, 1992, which is a continuation-in-part of Application Serial No. 07/652,869 filed February 8, 1991.

2. Stephen A. Brown is a co-author of the paper, Funk et al. (1990) Biochemistry 26:1654-1660 (Reference AT). Brown is a laboratory technician who worked under our direction in all experiments reported in the paper (as well as in the patent application) in which he was involved.

We declare further that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Walter D. Funk — April 15, 1993
Date

Ross T.A. MacGillivray — May 4, 1993
Date

Anne B. Mason — April 7, 1993
Date

Robert C. Woodworth — April 7, 1993
Date